ANDREA VIAN

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FONDAMENTI DI WEB DESIGN

A WALK THROUGH WEB CONCEPTS AND TECHNOLOGIES

- Education
  - Degree in Applied Math
  - Master in Information Science
  - Ph.D. in Computer Science

- Expertise
  - Parallel and Distributed Computing
  - Heterogeneous Architecture
  - Web Technologies

- Application Domains
  - Environmental Science
  - Bioinformatics
  - Image Processing

- I'm a bit nerd, but I read classics in my free(!) time
- E.g., Math for me is also abstraction and philosophy

Who I am

Researcher at the Institute of Applied Mathematics and Information Technologies
National Research Council

Associated researcher at CIMA Foundation

Contract Professor at UNIGE

imati

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- Education
  - Degree in TLC Engineering
  - Web Developer and programmer (PHP, Java, C#,..)
  - High School Teacher
  - Contract Professor at DAD and DISFOR
  - Free consultant

And now..
  - PhD student in "Scienze e Tecnologie del Mare"

Laura Pagani

High School Teacher in Maths, Physics and IT
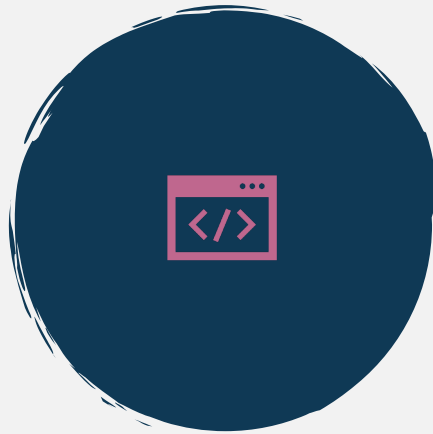
Teaching Assistant at UNIGE

And now it's your turn

Which are your expectation

your wish

your expertise

your will

The aim of the course

What you should have acquired at the end of these lessons

Awareness

Get familiar with the very basics about the web

Technological skills

Be able of develop a nice web site by your own

Have fun

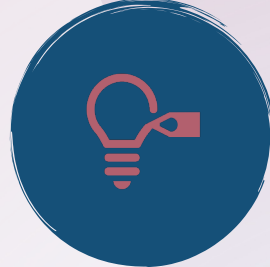Keep the occasion to enjoy learning cool stuff

A walk through

A web site…

What actually is? Focusing on the «dark side»

The magic of being online…

A roadmap to publish a site: domain, hosting…

How is built…

Technologies beyond the front end

Let's give a try!

Practical development and tutorial

Exam

To obtain the credit of the course, a test on all topics
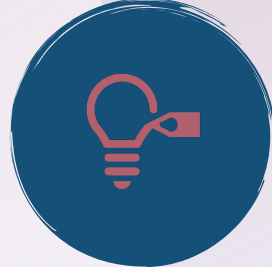
A walk through

- The course presents a methodological approach as to provide a list of possible steps, way of thinking and (possible) useful info to start at your own path

A web site...   The magic of being online...   How is built...   Let's give a try!   Exam

- Take into account that:
  - Web technology runs out very fast
  - Almost all the stuff depends on your requirements
  - Some insights and suggestions will be provided

Course and Exam

PLEASE REMEMBER!

AulaWeb and Whatsapp are the official channels for communications

Two different MANDATORY assignments

10 → HTML + CSS exercises

20 → A website in WordPress and the related document describing the work

Course and Exam

HTML + CSS exercises - maximum 10 points

- considering arguments presented during the lessons, from time to time we propose specific exercises,

- three submissions are foreseen but more details will be provided at due time

Assignments must be submitted through specific forms within the deadlines.

Late submissions will be not accepted.

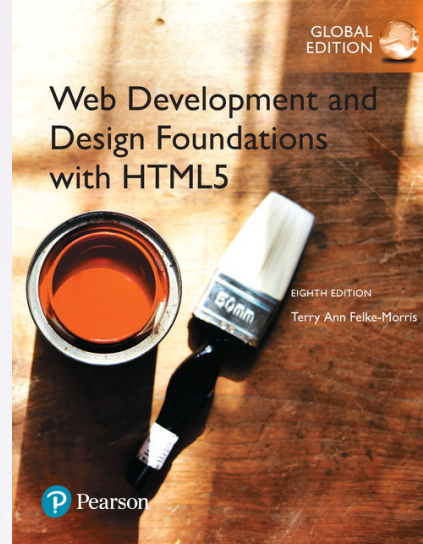**A website in WordPress + documentation**

- the topic must be chosen by students, depending on his/her interests, passions, curiosity, etc

- the site must be at least 4 pages, NO BLOG, NO eCommerce, etc

- the template for the document describing the site is available at this link

References for the course

- Slides and tutorial from YouTube (in Aulaweb)

- The World Wide Web Consortium (W3C) web site:
    - W3C standards, http://w3c.org
    - W3C validator, https://validator.w3.org
    - W3C school, https://www.w3schools.com/html

- Suggested Books:

https://www.webdevfoundations.net   https://webdevbasics.net

What this a web site... as communication tool

- A website is a way to communicate specific contents that can be exploited by companies or by any person who wants to tell, describe or explain a specific topic
  - It is often defined as communication tool to widespread specific topics
  - Can be static or dynamic... We'll be back on this point

- Examples of types of websites present online
  - business website or **showcase site**
  - website to sell online, **e-commerce**
  - personal website such as a diary or **blog**
  - website for exchanging opinions, **forum**
  - a website where you can share experiences, **social networks**
  - a website that provides services or goods, **institutional sites**
  - website to convince and sell a single product, **landing page**
  - a website can include professionals from a sector, **web portals**
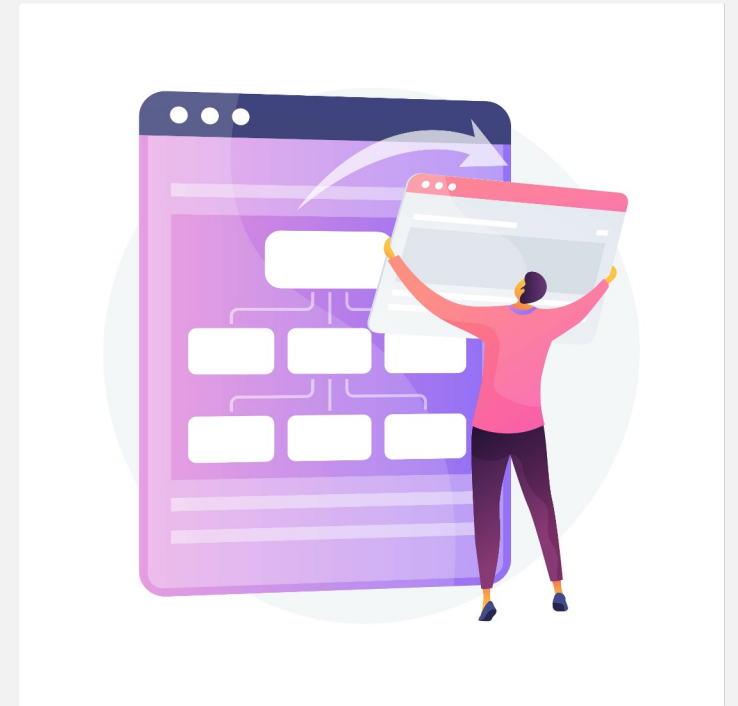
What this a web site… as communication tool

- Multiple functions and various services based on specific needs, generally:

  - **disseminate** (publish or advertise) any information related to the activity described in website
    - company sites that promote their business or its products, personal sites with autobiographical content or related to their interests (blogs, personal diaries, company blogs), etc..;

  - **collect content** in ordered lists filtered by a specific category, or by querying
    - search engines, music and film sites, sports sites with championship data, etc ...:

  - **bring people together** in a virtual community for social (social network) or recreational purposes (online gaming sites) or to discuss and compare on a specific topic (discussion forum)

  - **sell products or a service** offered by company through web designed for e-commerce

What this a web site... a bit more technical

- A **website** (also written as **web site**) is a collection of <u>web pages</u> and related content that is identified by a common <u>domain name</u> and published on at least one <u>web server</u>. Notable examples are <u>wikipedia.org</u>, <u>google.com</u>, and <u>amazon.com</u>

  - All publicly accessible websites collectively constitute the <u>World Wide Web</u>. There are also private websites that can only be accessed on a <u>private network</u>, such as a company's internal website for its employees

  - Websites are typically dedicated to a particular topic or purpose [...] <u>Hyperlinking</u> between web pages guides the navigation of the site, which often starts with a <u>home page</u>

  - <u>Users</u> can access websites on a range of devices, including <u>desktops</u>, <u>laptops</u>, <u>tablets</u>, and <u>smartphones</u>. The <u>software application</u> used on these devices is called a <u>web browser</u>

Just a minute to think about tech…

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What this a web site… a bit more technical

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- A web page (or webpage) is a specific collection of content provided by a website and displayed to a user in a web browser. A website typically consists of many web pages linked together in a coherent fashion. The name "web page" is a metaphor of paper pages bound together into a book.

A website is a **hypertextual** set of documents that resides via **hosting** on a **web server**, which can be reached by the end user typically through a common search engine and / or a web address identified by a common **domain name** via **web browser** and a **url**

First concepts

What we going to learn today...

What this a web site

Communication tool

Technical tool

Three parts of a web site

Technology

Contents

Marketing

Practical hands-on

Several hints for a domain and a hosting

An example of ...

This is your assignment for next lesson

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A web site

What we need to understand: a general vision

Technology

- To publish the site
  - Domain
  - Hosting
  - Web server
- To develop the site
  - HTML
  - CSS
  - JavaScript
  - PHP
  - etc

Content

- Structure of the site
- Single page info, image, media and graphical aspects

Marketing

- The target of the site
  - Out of the scope of this course…

  … but some few insights can be given

A web site

- A communication tool…
  - Made up of content: hypertext, images, video and media

- …reachable on the web…
  - through technology we mainly ignore but we currently employ

- …possibly organized in an appealing way
  - exploiting technology more familiar during the course

T E C H N O L O G Y

Computer Graphics and Communication

Infrastructure and Internet

Web Development

A simple explanation…
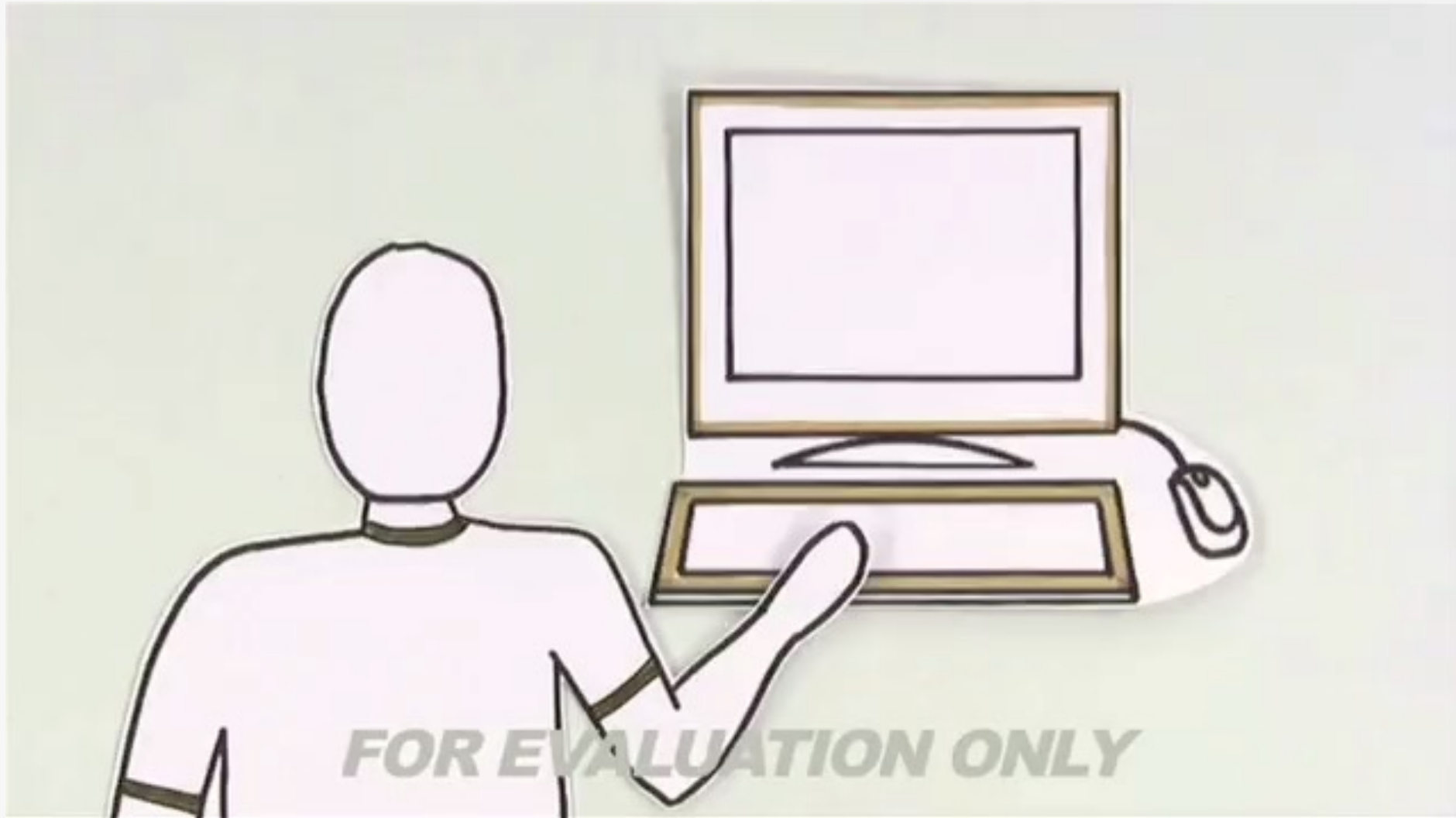
Technological aspects

Hypertext, images, video and media reachable on the web

Web host

A web host service allows individuals and organizations to make their website accessible via the World Wide Web.

Companies that provide space on a server owned or buy for use by clients, as well as providing Internet connectivity, typically in a data centre
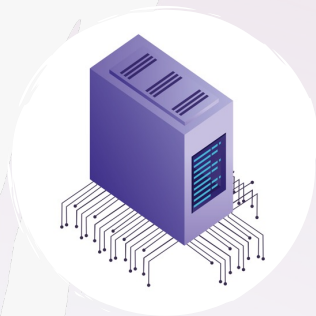
Web server

A system of (powerful) computers dedicated to run connectivity and software that satisfy client HTTP requests on the public World Wide Web as well as FTP transfer using different protocols

Domain name

The identification string that defines a realm of administrative autonomy, authority or control within the Internet

www.google.com www.unige.it

www.mydomainname.extension

Technological aspects
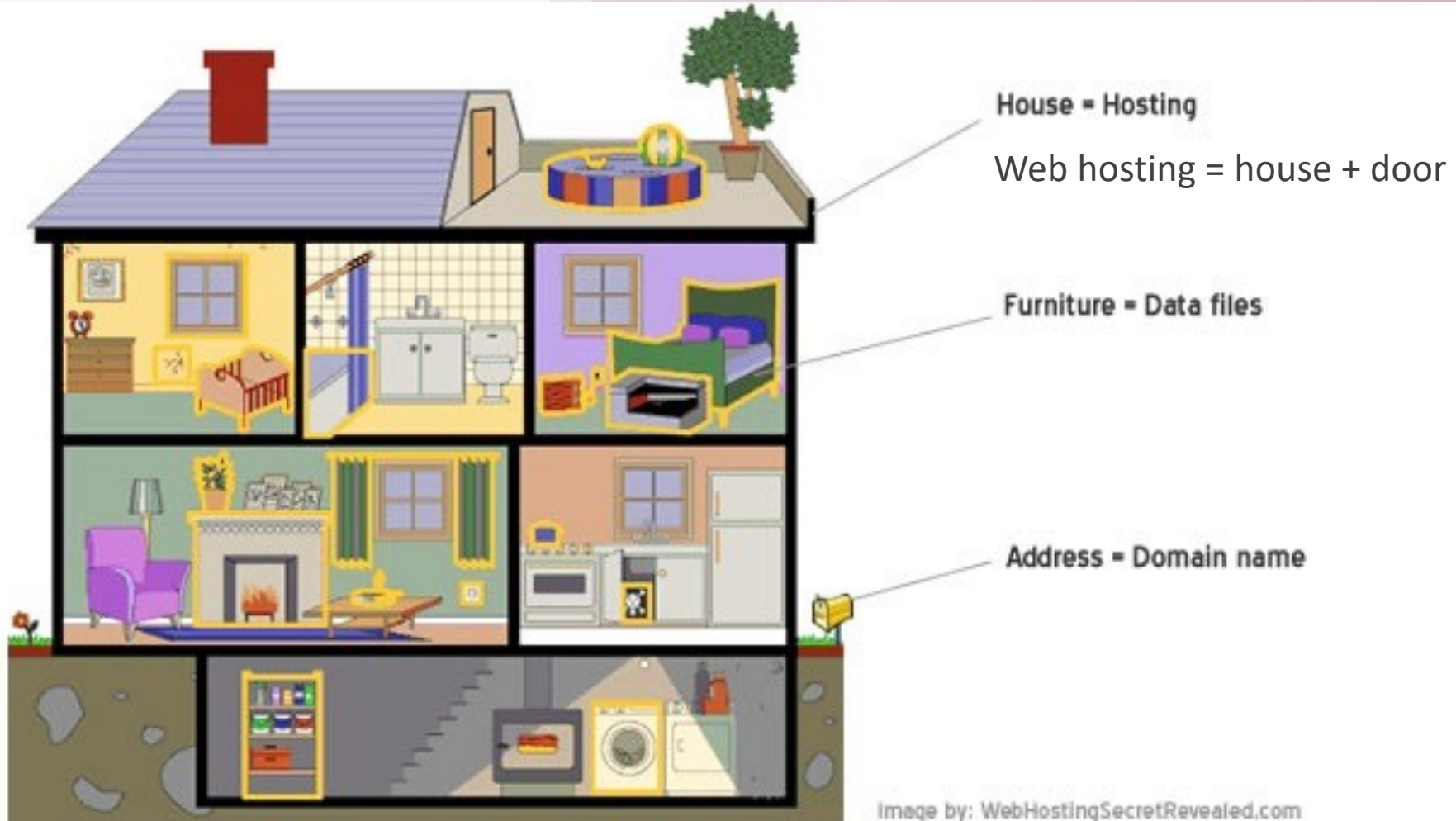
Hypertext, images, video and media reachable on the web

House = Hosting

Web hosting = house + door

Furniture = Data files

Address = Domain name

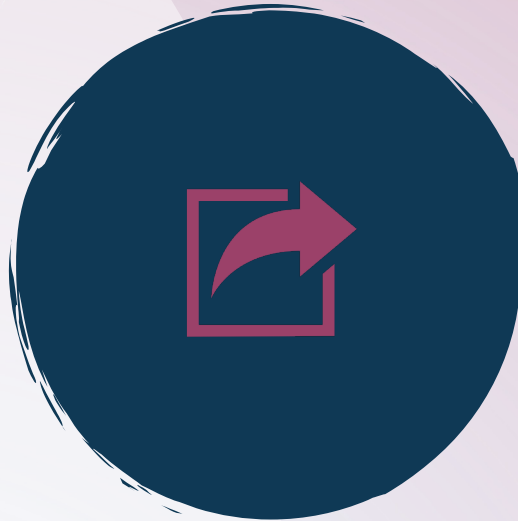Image by: WebHostingSecretRevealed.com

Some technicalities

Let's start

Web browser

Program to surf web resources

Chrome, Explorer, Firefox, Edge, Safari, Opera

Hypertext

Nice and effective explanation in the video on FB group
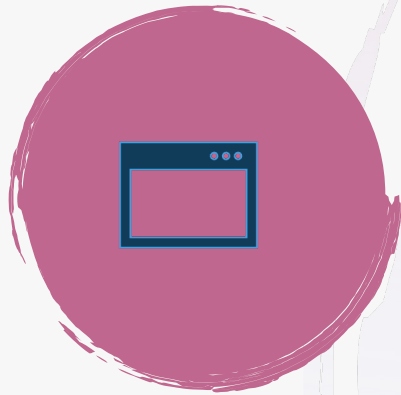
Web url

Colloquially termed a web address

in an address bar

A simple explanation…

Some technicalities

Let's start

Web browser

Program to surf web resources
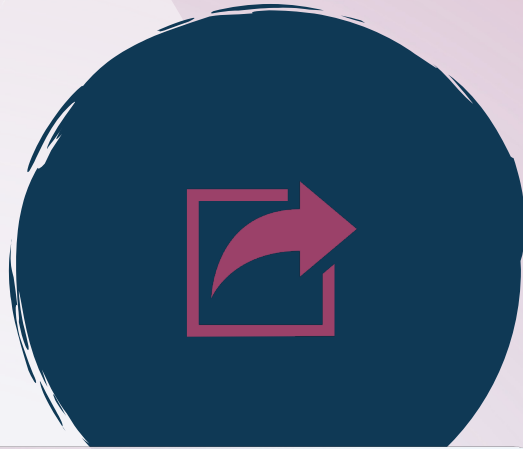
Chrome, Explorer, Firefox, Edge, Safari, Opera

- client functions for the HTTP protocol, i.e. the download of resources from web servers starting from their URL address;
- the visualization of hypertextual contents (usually within HTML documents)
- the reproduction of multimedia contents (rendering)

Some technicalities

Let's start

Web url

a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it;

commonly used for web pages (http), but are also used for file transfer (ftp), email (mailto), database access (JDBC), and many others
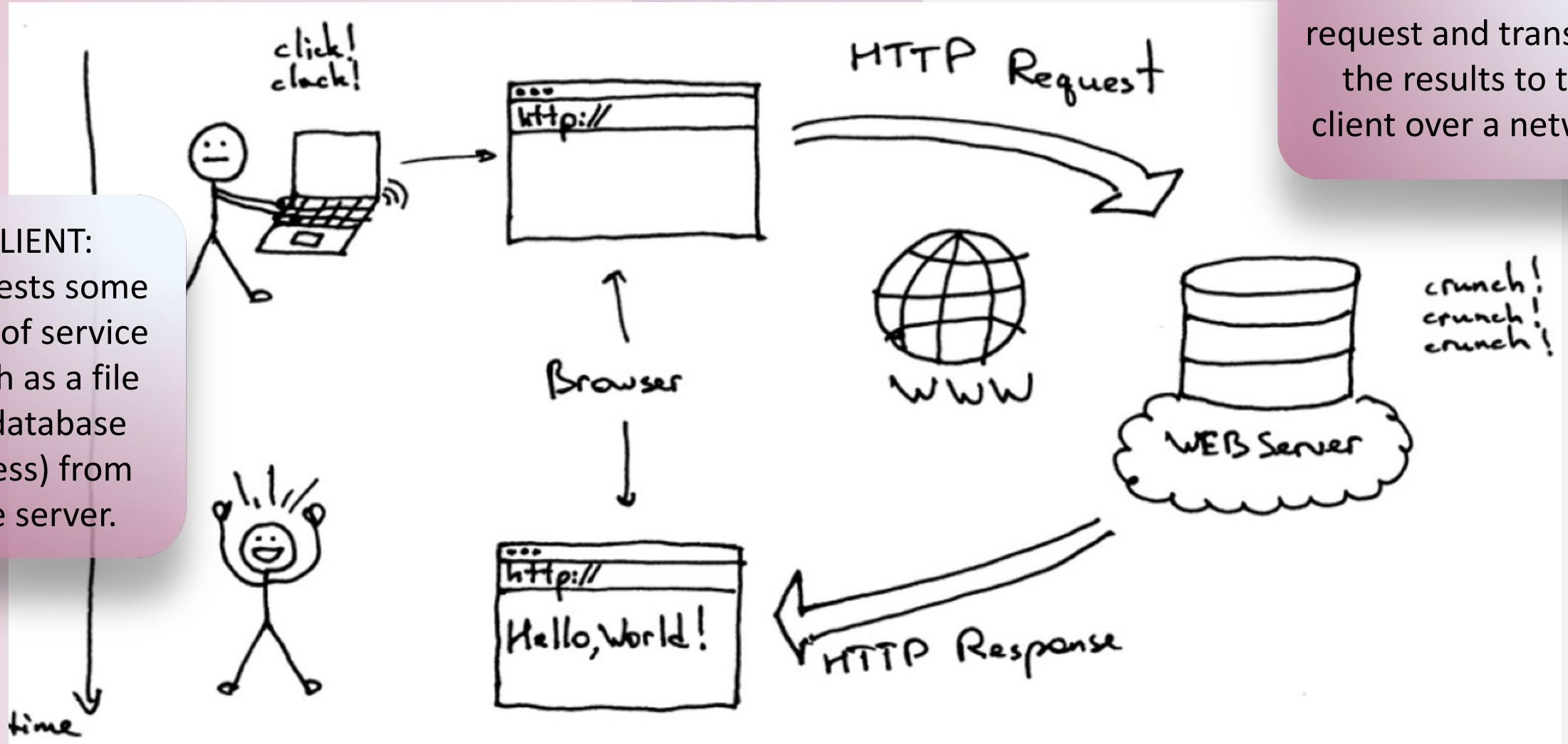
Colloquially termed a web address

in an address bar

Very few background information

SERVER: fulfills the request and transmits the results to the client over a network

CLIENT: requests some type of service (such as a file or database access) from the server.
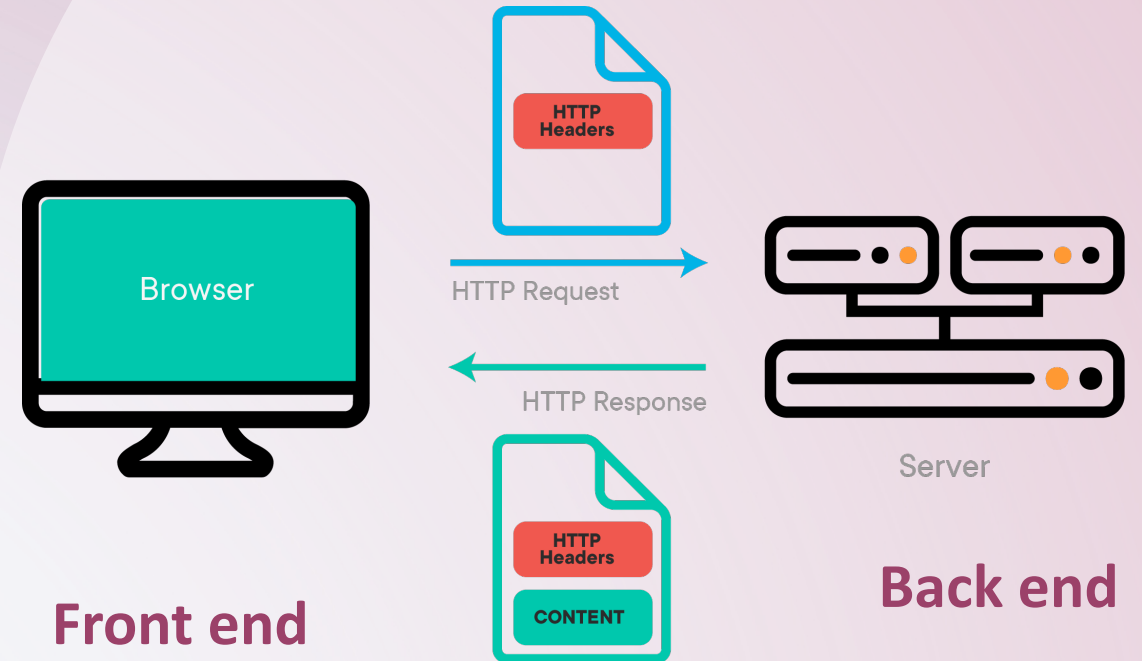
Very few background information

Server side, client side

- Client-side means that the action takes place on the user's (the client's) computer. Server-side means that the action takes place on a web server
  - Action we mean all that work that programming languages do
- To do its job, the computer has to understand the language its speaking
- Front end, back end
- Web design relates (among other) with front end design and development

How Web works

Front end

Back end

Browser

HTTP Headers

HTTP Request

HTTP Response

HTTP Headers

CONTENT

Server

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Very few background information

CLIENT

- Connected to the internet when needed
- Usually runs web browser software
- Uses http
- Requests web pages from server
- Receives web pages and files from server

SERVER

- Continually connected to the internet
- Runs web server software
- Uses http
- Receives requests for the web page form clients or proxies
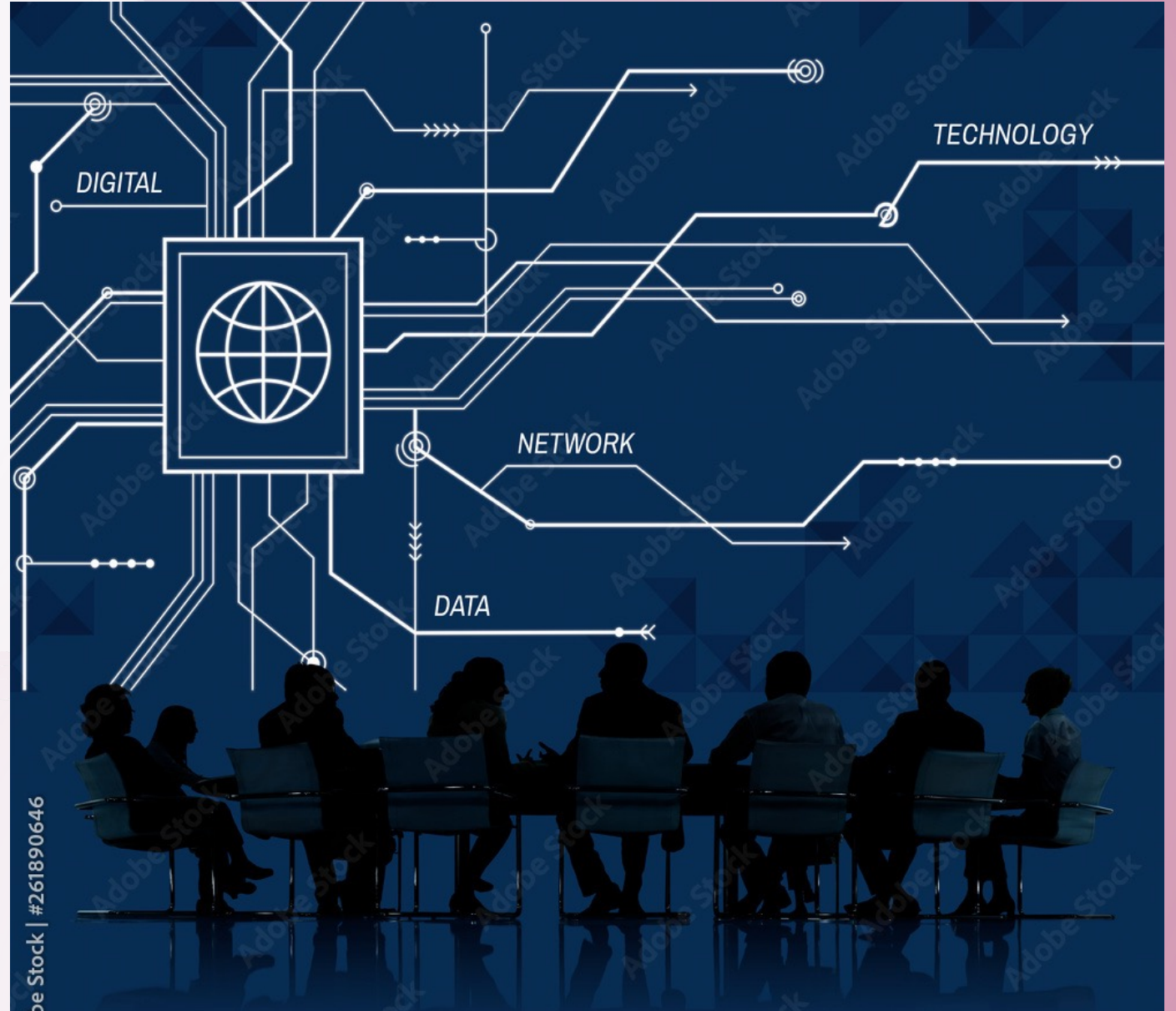- Responds to requests and transmits status code, web pages, files

HTTP Headers

Browser

HTTP Request

HTTP Response

Server

HTTP Headers

CONTENT
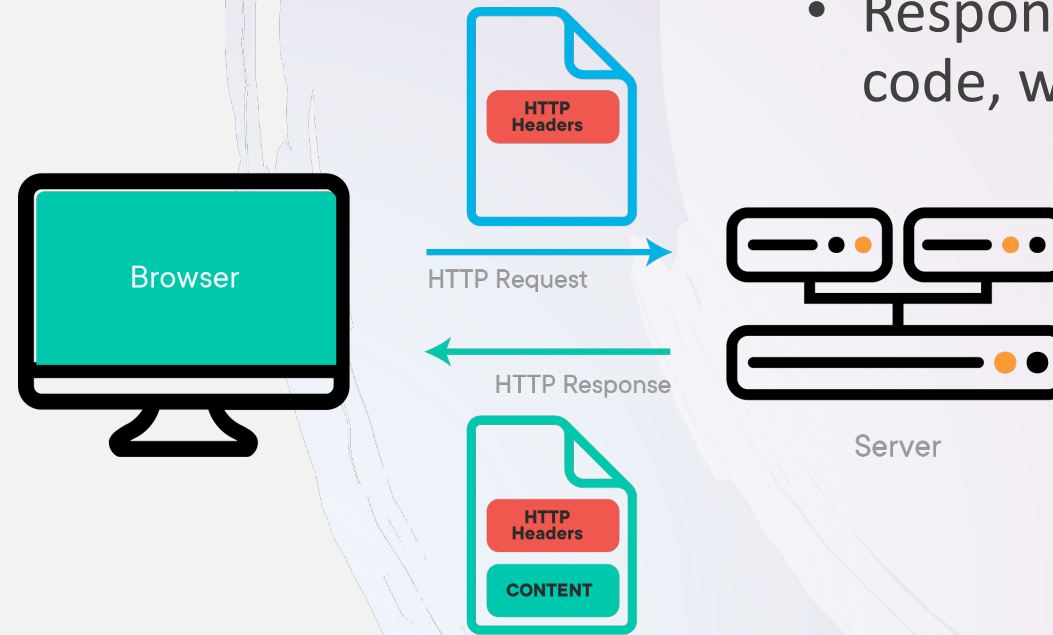
What we need to publish a site

Choose and buy a domain name

Purchase a web hosting plan

What we need to publish a site - domain name

- There is a register, an authority, and service vendors
    - Internet Corporation for Assigned Names and Numbers (ICANN)

- Find the perfect domain name is a difficult step of website creation
    - be prepared to availability issues
    - select the proper extension, i.e., first domain or Top Level Domain - TLD

- TLD depends on the scope of the site
    - if the target is the Italian market .it is a possible choice
    - international market -> .com
    - Public Institutions -> .org   university etc -> .edu   Europena Organization, projects, etc -> .eu

What we need to publish a site - domain name

- Once defined the domain name, several paths can be followed
  - Prepare some variations, in case the name is not available
  - Domain name generator
    - Lean Domain Search, Startup Name Check, NameMesh, NameStall, Bust A Name, etc

- Business name generation and registration service
  - Naminum, Brandroot, NameCheap, GoDaddy, Hover, Gandi, Hostinger, etc
  - Pay a registration fee, range $ 10 - $ 35 depending on the TLD

- First, second, third level
  - .it unige.it   das.unige.it   cedia.unige.it/UniGePASS

What we need to publish a site - domain name

What we need to publish a site - Web hosting plan

- **What we need to publish a site -** Web hosting plan

- Traditionally, a web hosting provider is only involved in selling servers with basic software and technical support

- Nowadays, grouping different services together and allowing users to create, host and manage websites from a single service provider
  - Several types of hosting and (a plethora!) providers of web hosting services
  - Up to support in the development of the site: Website Builders or Online Store Builders
    - Wix, Weebly, Shopify, BigCommerce etc

- Some key qualities you need to consider before a web host are ease of use, pricing, server speed, and uptime rates
  - It is possible to find something for free – pros and cons

- **What we need to publish a site -** Web hosting plan

- Free options: Wix, FreeHosting, GoogieHost, AwardSpace, InterServer

- For this course we exploit NetSons https://www.netsons.com
  - All of you will "buy" a free hosting and domain, and develop a proper site
  - In a while we will see how

- You can save your money everywhere but not in the hosting
  - Again a plethora – pros and cons for each
  - Just to name a few: Hostinger, Hostwinds, A2 Hosting, FastComet, Siteground, etc

- Take into account that of course these lists are not exhaustive, very flexible and variable

How to develop a web site

- Three (or more) possible ways – if you would to it by yourself
  - From scratch
  - Exploiting Content Management Systems (CMSs)
  - Using a web builder

  - … and all the possible mixed solutions

  - WordPress, Joomla e Drupal

I would not spend time on that
Popular examples are: Wix,
Weebly, Shopify

WordPress

How to develop a web site from scratch

What we need to know: mandatory (basic) skills and tools

Knowledge

IDE Integrated Development Environment

Client FTP

HTML, CSS, JavaScript, mySQL / PostgreSQL

Brackets, Sublime, Atom, Adobe Dreamweaver

fileZilla, WinSCP e Cyberduck

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How to develop a web site from scratch

HTML (Hyper Text Markup Language)

- Basic structure that makes semantic content for the web browser

- Sequential tags (with an opening and a closing) and structurally a keyword enclosed in angle brackets

Scripting Language

- HTML and CSS are not interactive. To create a dynamic web page we need languages like JavaScript and jQuery

- Server-side languages like PHP, Python, and Ruby may also be needed over time

CSS (Cascading Style Sheets)

- Style language used to "decorate" the HTML markup of a web page

- Without CSS, a web page would appear as a large white page with unordered text and images

Database Management

- To store, manage and access data of a website a database is needed

- DB management system: MySQL, MongoDB and PostgreSQL - server side

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How to develop a web site from scratch

FTP (File Transfer Protocol) Client

- FTP is used to transfer the source files of a website to the hosted server
  - We need to put the furniture in the house
- There are web-based and software-based FTP clients that can be used to upload your files to the server computer
- Good client fileZilla, WinSCP e Cyberduck
  - In our site, we are deciding to build everything online so we won't have this step

We would go more in details in this part

- We will describe di main steps to develop a web site
- You'll have exercise on HTML and CSS
  - To whom it may be interesting also JavaScript
- As we already said, this will be part of your examination

Exploiting CMS

Content Management Systems: what we need to know

Highlights

Basics about Computer and the Internet

Knowledge

HTML, CSS and PHP (not mandatory but suitable)

Tools

WordPress, Joomla and Drupal

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How to develop a web site exploiting CMS

- CMS is suitable for both first-day beginners and experienced web developers
  - We start with a first-aid approach, but we would love to move towards a more experienced use

- Software application to easily create and manage online content
  - Many open-source and free

- Basics of HTML, CSS, or PHP, it's beneficial - not a big deal if you don't
  - These platforms are very intuitive

- Top three free possibilities: WordPress, Joomla and Drupal

How to develop a web site exploiting CMS

- CMS is suitable for both first-day beginners and experienced web developers
  - We start with a first-aid approach but I would love to move towards a more experienced use

Features	WordPress	Joomla	Drupal
Cost	Free	Free	Free
Num. of installations	311,682 milions	26,474 milions	31,216 milions
Free themes	4,000+	1,000+	2,000+
Free plugin	45,000+	7,000+	34,000+

- Top three free possibilities: WordPress, Joomla and Drupal

How to develop a web site exploiting CMS - WordPress

WordPress

- Used mainly for small and medium-sized blogs and websites
  - It was born for blogs then moved to websites – that's why is so widespread

- However, many powerful websites prefer WordPress for its simplicity

- WYSIWYG Editor – pronounced /ˈwɪziwɪg/ "wiz-ee-wig"
  - Acronym for "what you see is what you get" - developer see what the end result will look like
  - In the "back-end" you have your HTML tags automatically and transparently

- Perfect for beginners and heavily developed by several classes of web developers
  - Many free plugins and themes as well as third party resources

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How to develop a web site exploiting CMS - WordPress

Pros

- Highly flexible and customizable
- Easy to use
- Tons of learning resources
- Excellent community and support

Cons

- Requires code for major visual customizations
- Updates may cause problems with plugins

Sites created using WordPress: Mercedes Benz, Walt Disney Company, biblioteca di Greenwich

How to develop a web site exploiting CMS - Joomla

Joomla

- Similar to WordPress in many ways
  - easy to use, easy to install, easily expanded with the help of modules - the equivalent of WordPress plugins, WYSIWYG editor, styles and templates to quickly customize the front end

- Thus is again perfect for beginners
  - However: large number of options available and two menu that be "confusing"

- Simplest solution to set up a social network
  - With platforms like EasySocial and JomSocial, you are minutes away from your social networking site

How to develop a web site exploi

Joomla

- Similar to WordPress in many ways
  - easy to use, easy to install, easily expand
    WordPress plugins, styles and templates

confusing 🙁

es away from your social

How to develop a web site exploiting CMS - Joomla

Pros

- The same of WordPress (more or less!)

- More technically advanced

- Generally better performance

- Enterprise-wide security

Cons

- Forms are difficult to maintain

- Mid-level CMS
  - Not as easy as WordPress, not as advanced as Drupal site
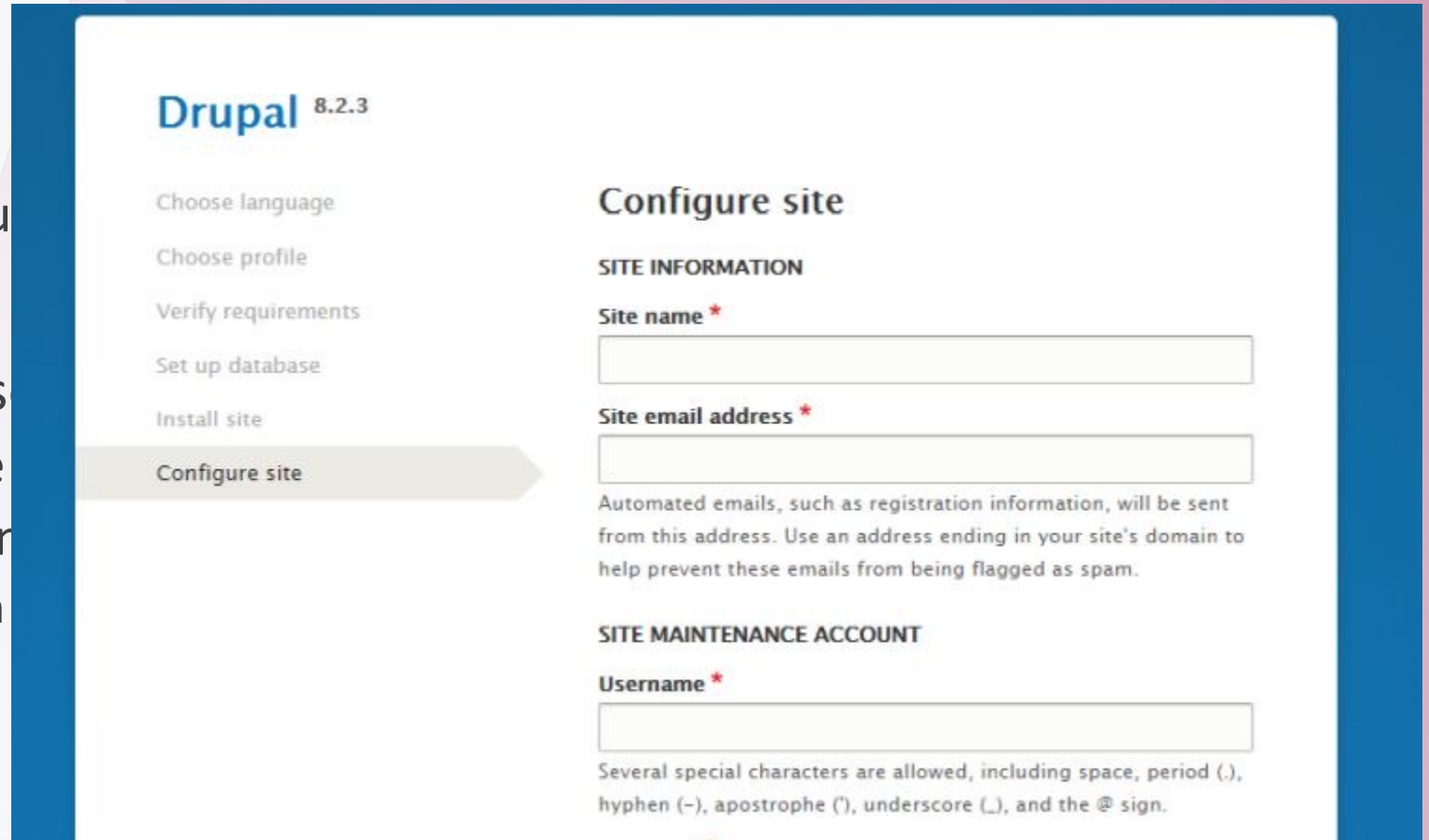
Sites created using Joomla: Lipton, Linux, Università di Harvard

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How to develop a web site exploiting CMS - Drupal

- Drupal

- Most powerful CMS
  - Underestimation considering Drupal as a simple CMS

- However, the most difficult to use
  - Due to its flexibility, Drupal is the second most used CMS in the world
  - But not actually suitable for beginners
    - Need to get hands dirty and learn the basics of coding

How to develop a web site exploiting CMS - Drupal

- Drupal

- Most powerful CMS
  - Underestimation considering Dru

- However, the most difficult to us
  - Due to its flexibility, Drupal is the
  - But not actually suitable for begin
    - Need to get hands dirty and learn

How to develop a web site exploiting CMS - Drupal

- Pros
  - Very powerful
  - Easy to learn for advanced users
  - Great help portal
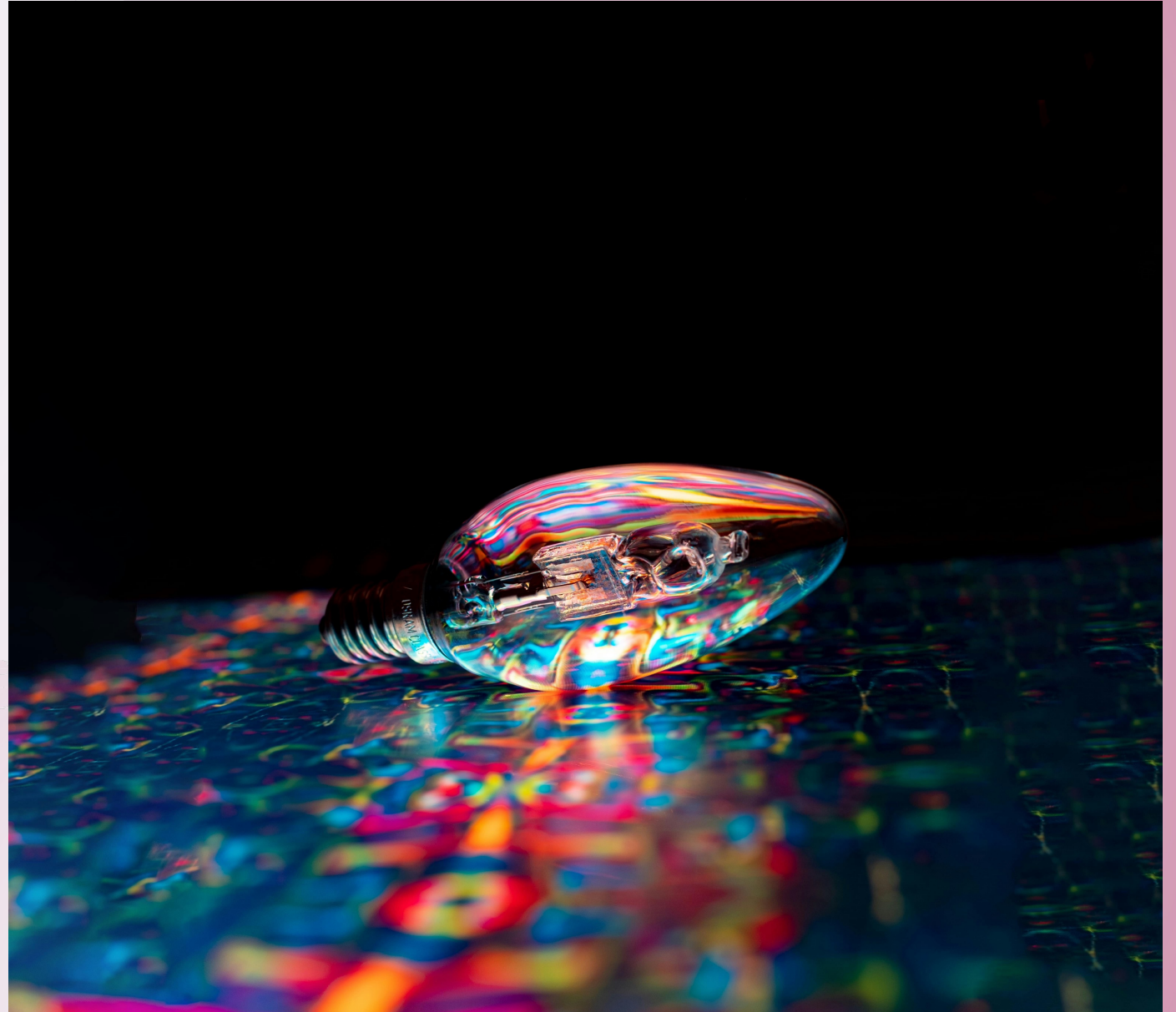 - Updates integrate seamlessly
  - Other integrated options

Cons
  - Steep learning curve early on - recommended for advanced users

Sites created using Drupal: Tesla, Warner Bros. Records, Università di Oxford

We gave a try

Let's go online and then the first steps with WordPress…

Class Assignments – creazione del dominio e comincino a pensare al sito

- Following the last tutorial:
  - purchase your (free) hosting plan, we suggested Netsons but feel free to select the host you prefer more!
    - we don't want you pay, but again it's up to you...
  - navigate and play around the available themes – even out of the one present on Netsons
  - think about the topic of your site, this is very important

- In one or two weeks, we are going to start exercises on WordPress, so pls do not take to long to decide and start your site

A different (?) kind of study

High practical and interactive

A way of thinking

A methodological approach

GRAZIE

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You find us on Teams chat

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